

**WHAT IS CLAIMED IS:**

- 1      1. An isolated nucleic acid comprising at least one adenine base, at least one guanine base,  
2      at least one cytosine base, and at least one thymine or uracil base, wherein said isolated nucleic  
3      acid is at least 12 bases in length, and hybridizes to the sense or antisense strand of a second  
4      nucleic acid under hybridization conditions, said second nucleic acid having a sequence as set  
5      forth in SEQ ID NO:1, 2, 5, 6, 7, 8, 9, 10, 13, 14, 15, 16, 17, 20, 22, 23, 24, 25, 28, 29, 33, 34,  
6      35, 37, 39, 40, 41, 42, 43, 44, 47, 49, 50, 51, 52, 53, 54, 55, 56, or 57.
- 1      2. The isolated nucleic acid of claim 1, wherein said hybridization conditions are  
2      moderately stringent hybridization conditions.
- 1      3. The isolated nucleic acid of claim 1, wherein said hybridization conditions are highly  
2      stringent hybridization conditions.
- 1      4. An isolated nucleic acid, wherein said isolated nucleic acid comprises a nucleic acid  
2      sequence that encodes an amino acid sequence at least five amino acids in length, said amino  
3      acid sequence comprising at least three different amino acid residues, and being identical to a  
4      contiguous portion of sequence set forth in SEQ ID NO:11, 21, 30, 36, 38, or 48.
- 1      5. An isolated nucleic acid comprising a nucleic acid sequence at least 60 percent identical  
2      to the sequence set forth in SEQ ID NO:1, 2, 5, 6, 7, 8, 9, 10, 13, 14, 15, 16, 17, 20, 22, 23, 24,  
3      25, 28, 29, 33, 34, 35, 37, 39, 40, 41, 42, 43, 44, 47, 49, 50, 51, 52, 53, 54, 55, 56, or 57.
- 1      6. An isolated nucleic acid, wherein said isolated nucleic acid comprises a nucleic acid  
2      sequence that encodes an amino acid sequence at least 60 percent identical to the sequence set  
3      forth in SEQ ID NO:11, 21, 30, 36, 38, or 48.

- 1      7. An isolated nucleic acid comprising a nucleic acid sequence as set forth in SEQ ID NO:1,  
2      2, 5, 6, 7, 8, 9, 10, 13, 14, 15, 16, 17, 20, 22, 23, 24, 25, 28, 29, 33, 34, 35, 37, 39, 40, 41, 42, 43,  
3      44, 47, 49, 50, 51, 52, 53, 54, 55, 56, or 57.
- 1      8. A substantially pure polypeptide comprising an amino acid sequence encoded by a  
2      nucleic acid of claim 1.
- 1      9. A substantially pure polypeptide comprising an amino acid sequence as set forth in SEQ  
2      ID NO:11, 21, 30, 36, 38, or 48.
- 1      10. A substantially pure polypeptide comprising an amino acid sequence at least 60 percent  
2      identical to the sequence set forth in SEQ ID NO:11, 21, 30, 36, 38, or 48.
- 1      11. A substantially pure polypeptide comprising an amino acid sequence at least five amino  
2      acids in length, said amino acid sequence comprising at least three different amino acid residues,  
3      and being identical to a contiguous stretch of sequence set forth in SEQ ID NO:11, 21, 30, 36,  
4      38, or 48.
- 1      12. A host cell containing an isolated nucleic acid of claim 1.
- 1      13. The host cell of claim 12, wherein said host cell is a eukaryotic cell.
- 1      14. An antibody having specific binding affinity for an amino acid sequence encoded by a  
2      nucleic acid of claim 1.
- 1      15. The antibody of claim 14, wherein said antibody is monoclonal.
- 1      16. The antibody of claim 14, wherein said antibody is polyclonal.

- 1      17. A cDNA library comprising a plurality of clones, wherein each clone comprises a cDNA  
2      insert and wherein at least about 15 percent of said clones comprise cDNA derived from  
3      immediate early genes.
- 1      18. The cDNA library of claim 17, wherein at least about 20 percent of said clones comprise  
2      cDNA derived from immediate early genes.
- 1      19. The cDNA library of claim 17, wherein at least about 25 percent of said clones comprise  
2      cDNA derived from immediate early genes.
- 1      20. The cDNA library of claim 17, wherein said immediate early genes are immediate early  
2      genes responsive to a maximal electroconvulsive seizure.
- 1      21. The cDNA library of claim 17, wherein said cDNA library is a subtracted cDNA library.
- 1      22. The cDNA library of claim 21, wherein said subtracted cDNA library is IEG-Reg cDNA  
2      library.
- 1      23. The cDNA library of claim 21, wherein said subtracted cDNA library is IEG-Lg cDNA  
2      library.
- 1      24. An isolated nucleic acid derived from a cDNA library, wherein said cDNA library  
2      comprises a plurality of clones, wherein each clone comprises a cDNA insert and wherein at  
3      least about 15 percent of said clones comprise cDNA derived from immediate early genes.
- 1      25. The isolated nucleic acid of claim 24, wherein said isolated nucleic acid comprises a  
2      nucleic acid sequence of an immediate early gene.

1        26. A method of obtaining immediate early gene nucleic acid, said method comprising:  
2            a) providing a cDNA library, said cDNA library comprising a plurality of clones,  
3            wherein each clone comprises a cDNA insert and wherein at least about 15 percent of said clones  
4            comprise cDNA derived from immediate early genes;  
5            b) contacting at least a portion of said cDNA library with a probe, said probe containing  
6            at least one nucleic acid having a nucleic acid sequence derived from an immediate early gene;  
7            and  
8            c) selecting a member of said plurality of clones based on the hybridization of said at  
9            least one nucleic acid to said member under hybridization conditions, said member comprising  
10          said immediate early gene nucleic acid.

5        27. A method of treating an animal having a deficiency in a neuron's immediate early gene  
2            responsiveness to a stimulus, said method comprising administering a nucleic acid of claim 1 to  
3            said animal such that the effect of said deficiency is minimized.

1        28. The method of claim 27, wherein said deficiency comprises a reduced level of  
2            expression of an immediate early gene.

1        29. The method of claim 27, wherein said stimulus influences learning or memory.

1        30. The method of claim 29, wherein said stimulus comprises a maximal electroconvulsive  
2            seizure.

1        31. A method of treating an animal having a deficiency in a neuron's immediate early gene  
2            responsiveness to a stimulus, said method comprising administering a therapeutically effective  
3            amount of a substantially pure polypeptide of claim 8 to said animal such that the effect of said  
4            deficiency is minimized.

1       32. A method of treating an animal having a deficiency in a neuron's immediate early gene  
2 responsiveness to a stimulus, said method comprising administering an effective amount of cells  
3 to said animal such that the effect of said deficiency is minimized, said cells containing a nucleic  
4 acid of claim 1.

1       33. A method of treating an animal having a deficiency in a neuron's immediate early gene  
2 responsiveness to a stimulus, said method comprising administering a therapeutically effective of  
3 antibodies to said animal such that the effect of said deficiency is minimized, said antibodies  
4 having specific binding affinity for an amino acid sequence encoded by a nucleic acid of claim 1.

1       34. The method of claim 33, wherein said deficiency comprises an elevated level of  
2 expression of an immediate early gene.  
3  
4

5       35. A method of identifying a compound that modulates immediate early gene expression,  
6 said method comprising:

- 7           a) contacting a test compound with an immediate early gene nucleic acid; and
- 8           b) determining whether said test compound effects the expression of said immediate early  
9 gene nucleic acid, wherein the presence of an effect indicates that said test compound is said  
10 compound.

1       36. The method of claim 35, wherein said immediate early gene nucleic acid comprises a  
2 nucleic acid sequence as set forth in SEQ ID NO:1, 2, 5, 6, 7, 8, 9, 10, 13, 14, 15, 16, 17, 20, 22,  
3 23, 24, 25, 28, 29, 33, 34, 35, 37, 39, 40, 41, 42, 43, 44, 47, 49, 50, 51, 52, 53, 54, 55, 56, or 57.

1       37. The method of claim 35, wherein said effect is a reduction in the expression of said  
2 immediate early gene nucleic acid.

1       38. The method of claim 35, wherein said effect is an increase in the expression of said  
2 immediate early gene nucleic acid.

1       39. A method of identifying a compound that modulates immediate early gene polypeptide  
2 activity, said method comprising:

- 3           a) contacting a test compound with an immediate early gene polypeptide; and
- 4           b) determining whether said test compound effects the activity of said immediate early
- 5           gene polypeptide, wherein the presence of an effect indicates that said test compound is said
- 6           compound.

1       40. The method of claim 39, wherein said immediate early gene polypeptide comprises an  
2 amino acid sequence encoded by a nucleic acid of claim 1.

1       41. The method of claim 39, wherein said immediate early gene polypeptide comprises an  
2 amino acid sequence as set forth in SEQ ID NO:11, 21, 30, 36, 38, or 48.

1       42. The method of claim 39, wherein said effect is a reduction in the activity of said  
2 immediate early gene polypeptide.

1       43. The method of claim 39, wherein said effect is an increase in the activity of said  
2 immediate early gene polypeptide.

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